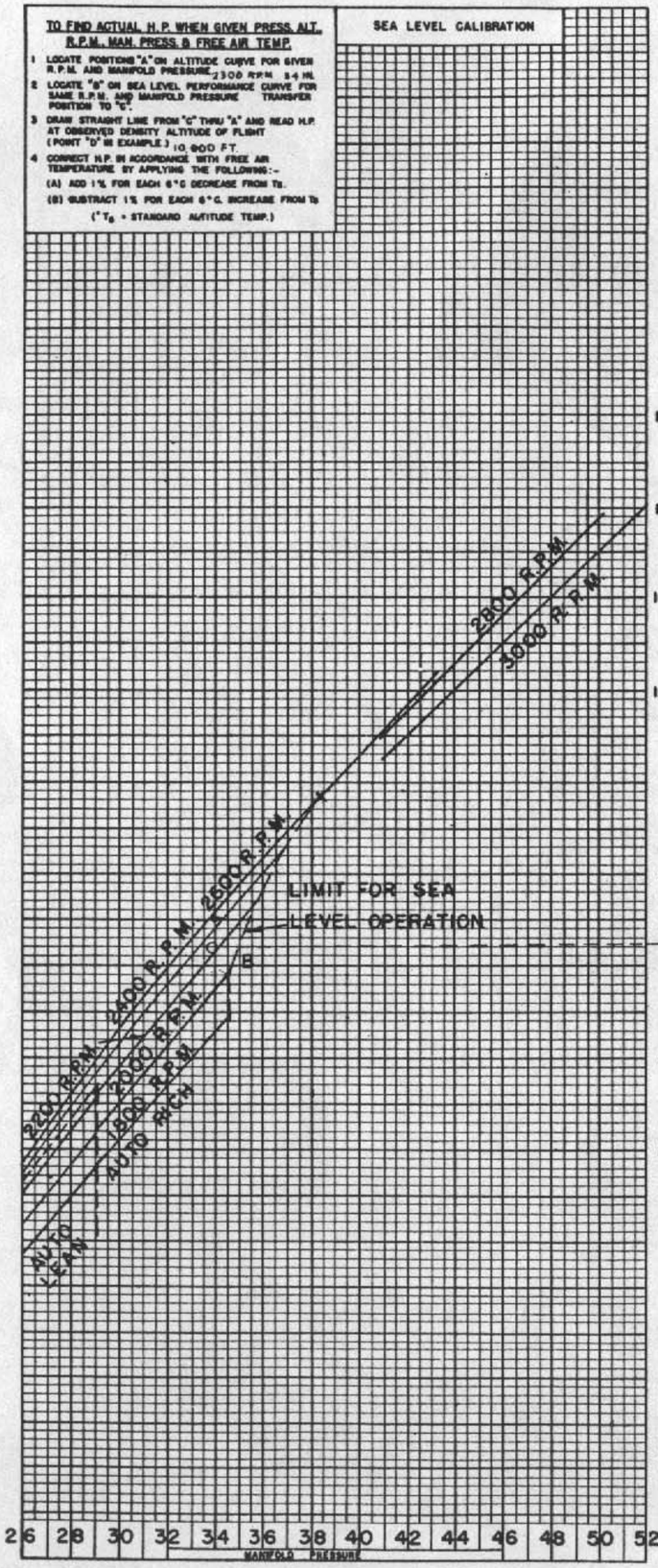
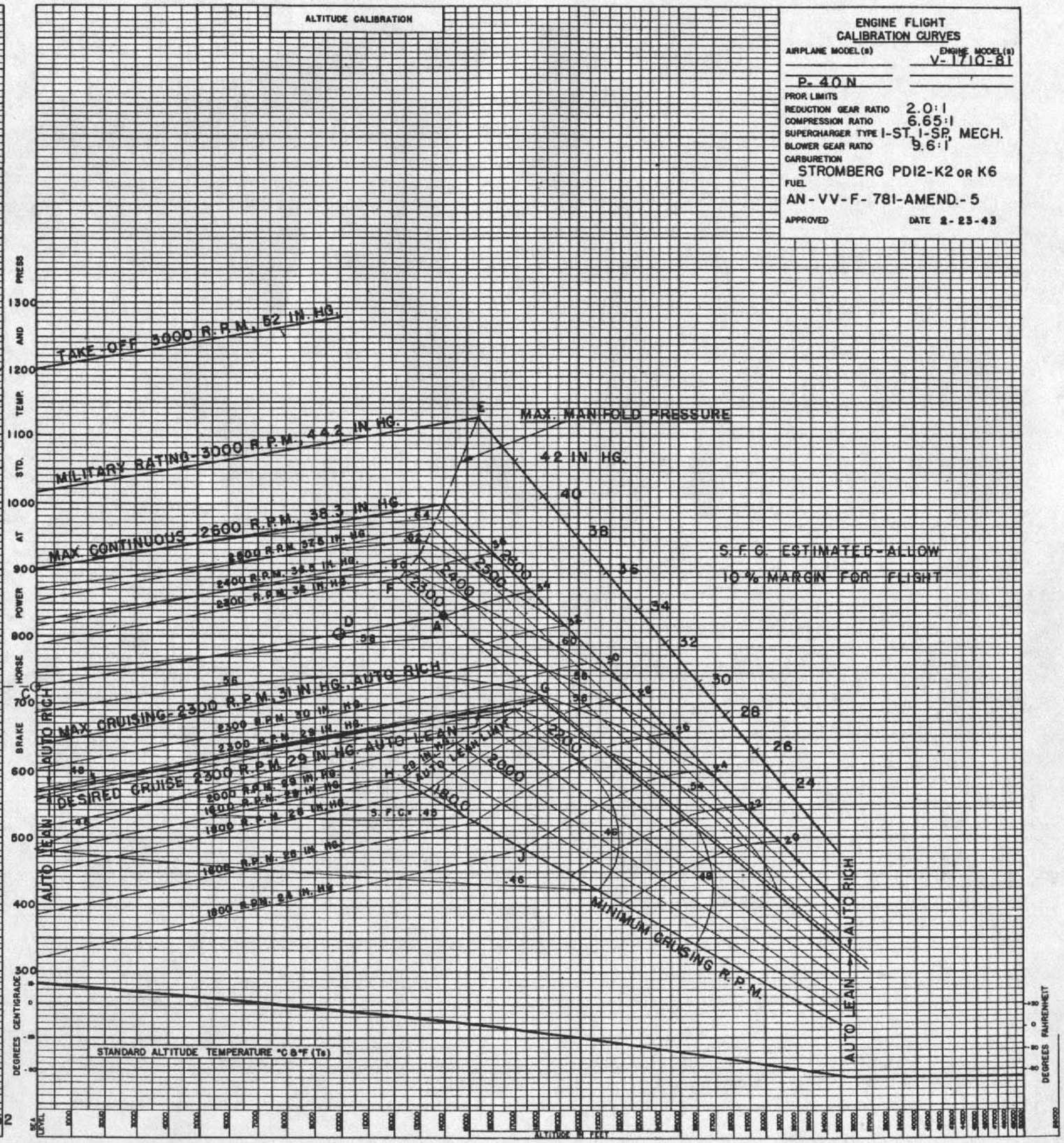
TO FIND ACTUAL H.P. WHEN GIVEN PRESS. ALT., R.P.M., MAN. PRESS. & FREE AIR TEMP.

1. LOCATE POSITION "A" ON ALTITUDE CURVE FOR GIVEN R.P.M. AND MANIFOLD PRESSURE (2300 R.P.M. 34 IN.)
2. LOCATE "B" ON SEA LEVEL PERFORMANCE CURVE FOR SAME R.P.M. AND MANIFOLD PRESSURE. TRANSFER POSITION TO "C".
3. DRAW STRAIGHT LINE FROM "C" THRU "A" AND READ H.P. AT OBSERVED DENSITY ALTITUDE OF FLIGHT (POINT "D" IN EXAMPLE.) (10,000 FT.)
4. CORRECT H.P. IN ACCORDANCE WITH FREE AIR TEMPERATURE BY APPLYING THE FOLLOWING:-
   (A) ADD 1% FOR EACH 6°C DECREASE FROM T_S.
   (B) SUBTRACT 1% FOR EACH 6°C. INCREASE FROM T_S.
   (T_S = STANDARD ALTITUDE TEMP.)

SEA LEVEL CALIBRATION



ALTITUDE CALIBRATION



ENGINE FLIGHT CALIBRATION CURVES

AIRPLANE MODEL(S)	ENGINE MODEL(S) V-1710-81
P-40N	
PROP. LIMITS	
REDUCTION GEAR RATIO	2.0:1
COMPRESSION RATIO	6.65:1
SUPERCHARGER TYPE	I-ST, I-SP, MECH.
BLOWER GEAR RATIO	9.6:1
CARBURETION	STROMBERG PD12-K2 OR K6
FUEL	AN-VV-F-781-AMEND.-5
APPROVED	DATE 2-23-43

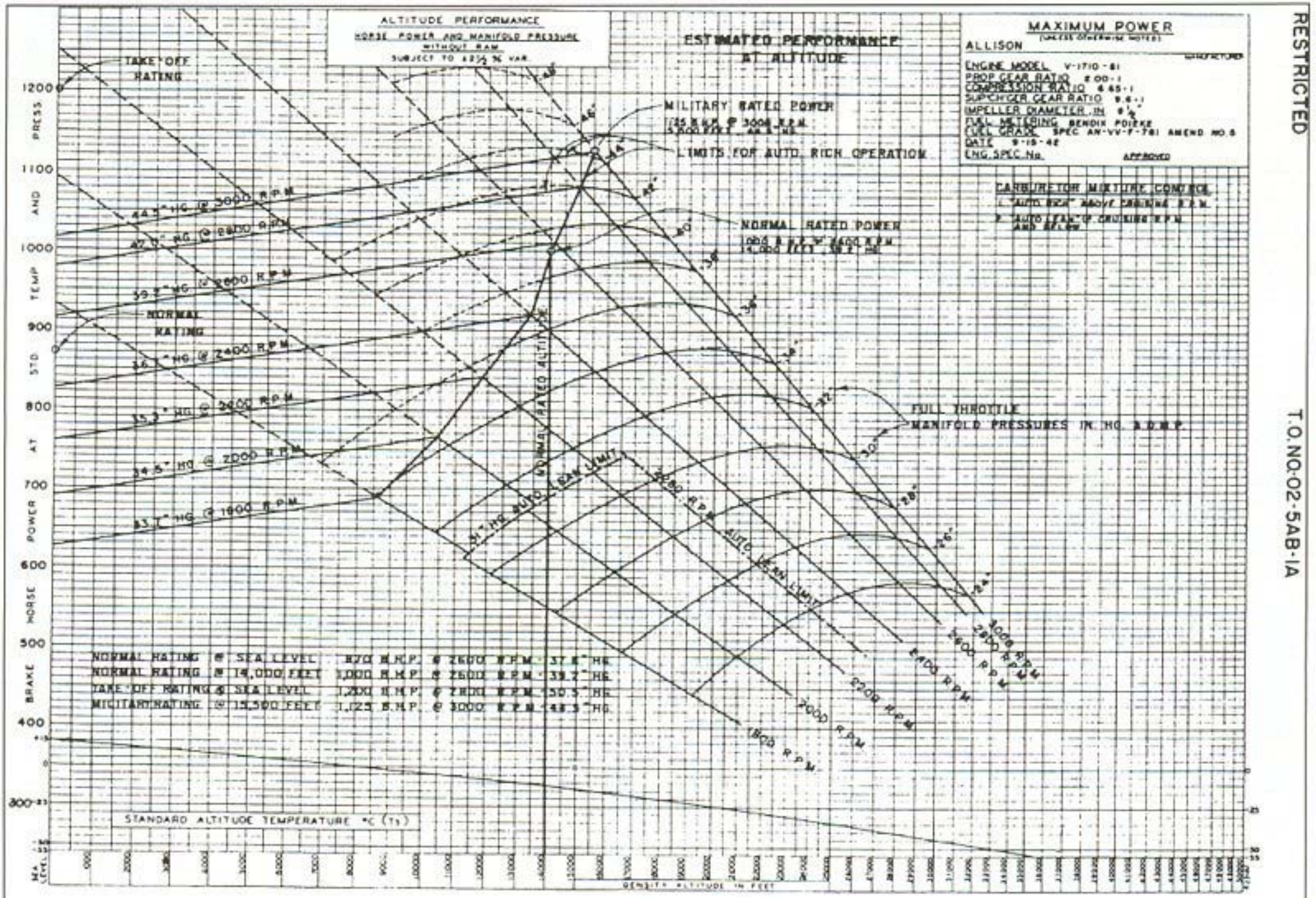


Figure 3 - Altitude Performance Chart - V-1710-81 Engine

1710-81 update specs (933x1468x24b jpeg)

11A

RESTRICTED.

AIR FORCE HEAD-QUARTERS.

AMENDMENT LIST NO.6 TO ALLISON INSTRUCTIONS.
AMENDMENT LIST NO.5 TO KITTYHAWK INSTRUCTIONS.

Allison Instruction No.2)
Kittyhawk Instruction No.2) are amended as follows :-

In table III (Power Table Kittyhawk III - Allison V1710-81) -

Delete Take Off R.P.M. "2800" and insert "3000".

Delete Take Off Manifold Pressure "50.5" HG," and insert "51.5" HG.

Delete Rated Power Manifold Pressure "39.5" HG." and insert "37.5" HG".

Delete Maximum Cruise R.P.M. "2280" and insert "2300".

In Table IV (Power Table Kittyhawk IV (P40N) - Allison V1710-99) -

Amend Operating Condition sub-title "All Out Climb and Level Climb" to read "All Out Climb and Level Flight".

- - - - -

Reference:- File R.A.A.F. 150/4/1847.

Date of Issue:- 28th April, 1944.

1710-81 old specs 2 (1200x1600x24b jpeg)

TABLE III.

POWER TABLE.

KITTYHAWK III - ALLISON V1710-81.

100 OCTANE OPERATING CONDITION	R.P.M. MANIFOLD PRESSURE AND ETC.	APPROX. FUEL CONSMP. GLS/HR.	REMARKS
TAKE OFF. R.P.M. Manifold Pressure Mixture Control Coolant Temp. } Max. Oil Temp. }	2800 50.5" Hg. Auto Rich 125°C. 95°C.	-	5 Minute Limit
ALL OUT CLIMB AND LEVEL FLIGHT. R.P.M. Manifold Pressure Mixture Control Coolant Temp. } Max. Oil Temp. }	3000 45.2" Hg. Auto Rich 115°C. 80°C.	110	15 Minute Limit
RATED POWER. R.P.M. Manifold Pressure Mixture Control Coolant Temp. } Max. Oil Temp. }	2600 39.5" Hg. Auto Rich 115°C. 80°C.	89	Maximum Continuous Power.
MAXIMUM CRUISE. R.P.M. Manifold Pressure Mixture Control Coolant Temp. } Desired. Oil Temp. }	2280 31.4" Hg. Auto Rich 105°-115°C. 60°-80°C.	56	
DESIRED CRUISE. R.P.M. Manifold Pressure Mixture Control Coolant Temp. } Desired Oil Temp. }	2280 28.9" Hg. Auto Lean 105°-115°C. 60°-80°C.	42	2190 @ 26.8" Hg. will give a cruise of approximately 70 B.H.P. less and fuel consumption of 38½ gals/hr.
ECONOMICAL CRUISE. R.P.M. Manifold Pressure Mixture Control Coolant Temp. } Desired Oil Temp. }	1950 23" Hg. Auto Lean 105°-115°C. 60°- 80°C.	23-32	These figures may be varied to suit specific operating conditions.
EMERGENCY: R.P.M. Manifold Pressure Mixture Control Coolant Temp. } Oil Temp. } Max.	3000 57" Hg. Auto Rich 125°C. 95°C.	-	5 Minute Limit.

v1710-81-3 (1022x744x256 jpeg)

Revised April 25, 1944

SPEC. AN-H-8
DEC. 18, 1942
FORM ASC-512

AIRPLANE MODELS

P-40M SERIES

SPECIFIC ENGINE FLIGHT CHART

ENGINE MODELS

V-1710-81

CONDITION	FUEL PRESSURE (LB/SQ. IN.)	OIL PRESSURE (LB/SQ. IN.)	OIL TEMP. °C	OIL TEMP. °F	COOLANT TEMP. °C	COOLANT TEMP. °F		
DESIRED	17±1	60-70	60-80	140-176	105-115	221-239		
MAXIMUM	18	85	95	203	125	257		
MINIMUM	12	55	20	68	85	185		
IDLING	9	15						

MAX. PERMISSIBLE DIVING RPM: 3120

CONDITION	ALLOWABLE OIL CONSUMPTION
MAX. CONT.	13,3 U.S.QT/HR 22 IMP.PT/HR
MAX. CRUISE	10 U.S.QT/HR 17 IMP.PT/HR
MIN. SPECIFIC	5-7 U.S.QT/HR 8-12 IMP.PT/HR

OIL GRADE: (S) ..... (W) .....

SUPERCHARGER TYPE: SINGLE STAGE, SINGLE SPEED, MECH. DRIVEN CENTRIFUGAL

FUEL GRADE: 100* OCTANE

OPERATING CONDITION	RPM	MANIFOLD PRESSURE (BOOST)	HORSE-POWER	CRITICAL ALTITUDE WITH RAM	CRITICAL ALTITUDE NO RAM	BLOWER	USE LOW BLOWER BELOW:	MIXTURE CONTROL POSITION	FUEL FLOW (GAL/HR/ENG.) U.S.	FUEL FLOW (GAL/HR/ENG.) IMP.	MAXIMUM CYL. TEMP. °C	MAXIMUM CYL. TEMP. °F	MAXIMUM DURATION (MINUTES)
TAKE-OFF	3000	52.0	1200	SEA LEVEL				AUTO RICH	135	112			5
WAR EMERGENCY	3000	57.0	1360	SEA LEVEL				AUTO RICH	170	142			5 **
MILITARY	3000	44.2	1125	14,600		SINGLE STAGE		AUTO RICH	147	123			15
MAXIMUM CONTINUOUS	2600	38.3	1000	13,800				AUTO RICH	121	100			
MAXIMUM CRUISE	2300	29.0	705	17,600				AUTO LEAN	67	55			
MINIMUM SPECIFIC CONSUMPTION	1950	23	310	S.L.				AUTO	23	19			
	1950	23	370	5,000					28	23			
	1950	23	430	10,000					32	27			
	1950	23	480	15,000				LEAN	35	29			
	1950	F.T.	510	20,000					38	32			

REMARKS: * SPEC. AN-VV-F-781 AMEND. 5. ** TO BE USED IN PRE-COMBAT OR COMBAT ZONES *ONLY*.
1. CRUISING BELOW 1800 RPM MAY RESULT IN INSUFFICIENT GENERATOR OUTPUT.
2. USE OF OVER 57 INCHES MANIFOLD PRESSURE WILL RESULT IN CYLINDER HEAD OR SOME OTHER ENGINE PART FAILURE.

T. O. No. 01-25CK-1

RESTRICTED

v-1710-81 2 (1617x1249x24b jpeg)

RESTRICTED

5-1-42

AIRPLANE MODELS: P-40M & N

SPECIFIC ENGINE FLIGHT CHART

ENGINE MODELS: V-1710-81

CONDITION	FUEL PRESSURE LB./SQ. IN.	OIL PRESSURE LB./SQ. IN.	OIL TEMP. °C	COOLANT TEMP. °C		
DESIRED	12 - 16	60 - 70	60 - 80	105 - 115		
MAXIMUM	16	85	95	125		
MINIMUM	12	55	20	85		
IDLING	9	15				

MAX. PERMISSIBLE DIVING R.P.M. 3120

CONDITION	ALLOWABLE OIL CONSUMPTION
"MAX CONTINUOUS"	22 IMP. PT./HR. 13.3 U.S. QT./HR.
"ECONOMICAL MAX."	17 IMP. PT./HR. 10 U.S. QT./HR.
"MIN. SPECIFIC"	8 - 12 IMP. PT./HR. 5 - 7 U.S. QT./HR.

OIL GRADE: (S) 1120 (W) 1100

SUPERCHARGER TYPE: 1 ST., - 1 SP., MECH. DRIVEN CENTRIFUGAL — FUEL OCTANE 100 (S-1+1.0)

OPERATING CONDITION	R.P.M.	MANIF. PRESS. (BOOST.)	HORSE POWER	CRITICAL ALTITUDE (FEET)	BLOWER	USE LOW BLOWER BELOW	MIXTURE CONTROL POSITION	FUEL FLOW (GAL./HR./ENG.) U.S.	FUEL FLOW IMP.	MAXIMUM CYL. TEMP. °C	MAXIMUM CYL. TEMP. °F	MAXIMUM DURATION (MINUTES)	REMARKS
TAKE-OFF	3000	52.0	1200	S. L.		FT. ALT.	AUTO RICH	148	123			5	
EMERGENCY MAXIMUM	3000	44.2	1125	14 200		FT. ALT.	AUTO RICH	135	112			15	
MAXIMUM CONTINUOUS	2600	38.3	1000	13800		FT. ALT.	AUTO RICH	108	90				
ECONOMICAL MAXIMUM	2300	29	705	17600		FT. ALT.	AUTO LEAN	59	49				
MINIMUM SPECIFIC CONSUMPTION	1800	29	585	12200		FT. ALT.	AUTO LEAN	44	37				
MINIMUM CRUISING	1800	24	480	17300		FT. ALT.	AUTO LEAN	36	30				
CONDITIONS TO AVOID	3000	57.0	1360	S. L.			AUTO RICH	170	142				WAR EMERGENCY RATING: TO BE USED ONLY IN PRE-COMBAT OR COMBAT ZONES. *EMERGENCY ONLY*

CRUISING BELOW 1800 RPM MAY RESULT IN INSUFFICIENT GENERATOR OUTPUT.

NOTE: CRITICAL ALTITUDE IS THAT AT WHICH MAXIMUM POWER IS OBTAINED WITH FULL THROTTLE UNDER CONDITIONS SHOWN.

FUEL FLOW ESTIMATED - ALLOW + 10% MARGIN FOR FLIGHT

RESTRICTED

T.O. NO.

SPEC. AN-H-8
DEC. 18, 1942
FORM ASC-517

AIRPLANE MODELS: P-40N

SPECIFIC ENGINE FLIGHT CHART

ENGINE MODELS: V-1710-81,-99,

CONDITION	FUEL PRESSURE (LB/SQ. IN.)	OIL PRESSURE (LB/SQ. IN.)	OIL TEMP. °C	OIL TEMP. °F	COOLANT TEMP. °C	COOLANT TEMP. °F
DESIRED	16 – 18	70	60 85	140 185	110 121	230 250
MAXIMUM	19	80	95	203	125	257
MINIMUM	14	60–55	40	104	85	185
IDLING	10	15				

MAX. PERMISSIBLE DIVING RPM:

CONDITION	ALLOWABLE OIL CONSUMPTION
MAX. CONT.	13.3 U.S.QT/HR. 22 IMP.PT/HR
MAX. CRUISE	10 U.S.QT/HR. 17 IMP.PT/HR
MIN. SPECIFIC	5 – 7 U.S.QT/HR. 8 – 12 IMP.PT/HR

OIL GRADE: (S) 1120 (W) 1100

SUPERCHARGER TYPE: 1 STAGE, 1 SPEED, MECH. DRIVEN CENTRIFUGAL

FUEL GRADE: 100/130 SPEC: AN-F-28

OPERATING CONDITION	RPM	MANIFOLD PRESSURE (BOOST)	HORSE-POWER	CRITICAL ALTITUDE WITH RAM	CRITICAL ALTITUDE NO RAM	BLOWER	USE LOW BLOWER BELOW:	MIXTURE CONTROL POSITION	FUEL FLOW (GAL./HR./ENG.) U.S.	FUEL FLOW (GAL./HR./ENG.) IMP.	MAXIMUM CYL. TEMP. °C	MAXIMUM CYL. TEMP. °F	MAXIMUM DURATION (MINUTES)
TAKE-OFF	3000	52	1200	SEA LEVEL	SEA LEVEL			A. R.	148	123			5
WAR EMERGENCY *	3000	57	1480	10000	7500			A. R.	170	142			EMERGENCY ONLY
MILITARY	3000	44.2	1125	17000	15000			A. R.	135	109			15
MAXIMUM CONTINUOUS	2600	38	1000		14400			A. R.	110	92			
MAXIMUM CRUISE	2300	31	760		16600			A. L.	63	53			
MINIMUM SPECIFIC CONSUMPTION	1800	29	585		12200			A. L.	44	37			
	1800	24	480		17300			A. L.	36	30			

REMARKS: CRUISING BELOW 1800 RPM MAY RESULT IN INSUFFICIENT GENERATOR OUTPUT.
* TO BE USED IN PRE-COMBAT OR COMBAT ZONES *ONLY*.
FUEL FLOW ESTIMATED – ALLOW + 10 % MARGIN FOR FLIGHT.

RED FIGURES HAVE NOT BEEN FLIGHT TESTED

W.P.-1-1-44-5M